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### **Identification of upgrading options for legume value chains using a comparison across countries and crops – Tanzania pigeonpea and Uganda groundnut**

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## Abstract

This report provides an overview of the results of a combined Value Chain workshop for pigeonpea in Tanzania and groundnut in Uganda. The workshop built on two separate studies and aimed at identifying upgrading opportunities and common lessons learned. Furthermore, it was designed to enable cross-country-crop learning and collaboration across fields. This report outlines the results of the workshop and gives a brief feedback on the design and its outcomes. It highlights the needs for information sharing and policy advocacy in the region. Additionally, the need for quality improvements and assurance schemes emerged as a common upgrading need across chains and countries.

**Keywords:** Value Chain Analysis, Uganda, Tanzania, groundnut, pigeonpea, Upgrading Opportunities

**JEL classification:** Q 10, Q13, Q18

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## 1 Introduction

Value chain analysis is a popular tool among scientists trying to improve the functioning of agricultural markets especially in developing countries. The analysis typically aims at generating 'upgrading options' for the chain to increase its efficiency and often tries to enable farmers to enhance their revenues from the chain by exploring on-farm value addition options. In the research arena these value chain projects often start with a stakeholder workshop to gather details and end with a report sent around with the aim of promoting implementation of the recommendations of the researcher.

The results presented here are based on two value chain studies conducted in 2013 for pigeonpea in Tanzania and for groundnut in Uganda. These two initial studies and this workshop have been implemented under the EC/IFAD funded project 'Enhancing Productivity of groundnut and pigeonpea Cropping Systems in Eastern Africa' which has recently been extended for a second phase. Following these studies, a workshop was conducted to follow up findings, verify information and deepen the results. Furthermore, the workshop aimed at facilitating the generation of common lessons and entry points for value chain upgrading by bringing together stakeholders from two countries and two crops in order to facilitate cross country and crop learning. The stakeholder group consisted of eight Ugandan participants 18 Tanzanians from national research organizations, farmer organizations, NGOs and private sector.

The main objectives to be addressed by the workshop and in this paper are (1) to verify and deepen the results from the individual value chain analysis; (2) identify upgrading options for the two value chains; (3) assess the common bottlenecks and the level at which they should be addressed and the (4) sharing of lessons learned from the value chain analysis. Additionally it aimed at (5) identifying areas in which a concerted approach across the two countries and two value chains would generate synergies. It was not intended to produce a workplan but rather to produce a repository of ideas and possible partners which could be pursued by stakeholders and/or donors.

The following sections present the results from the workshop and align with the timeline of the workshop. After presenting the approach taken in section 2, a brief summary of the value chain studies is given in section 3. The results of the discussions of these findings are then outlined in section 4 along with the common themes emerging from the individual country discussions. Section 5 will focus on the action points identified within the identified themes before concluding in section 6 and highlighting the envisioned way forward in section 7.

## 2 The process adopted for the workshop

Experience shows that in Value chain workshops focusing on one country and chain participants tend to get trapped in the discussions of small details and struggle thinking on aggregate levels. Therefore, it was attempted to overcome these obstacles by bringing together two different groups of stakeholders from two different countries and two different crops. The workshop was designed in order to enable the participants to engage in discussions at more abstract level and think beyond their country and crop situation. This

was supposed to enable more policy relevant results and generate interest in implementation by multinational NGOs or policy advocacy institutions.

The workshop started with a presentation of key findings from the authors of each study to the stakeholder groups separately. Based on these findings the participants identified areas for strategic intervention and elaborated actions to be taken to improve the performance of the groundnut value chain and the pigeonpea value chain. The groups were asked to present the results of the country/crop groups to the other group and the full group was then asked to identify common topics or themes that emerged from both studies and, where necessary, important topics that are particular for one of the chains.

Working groups were set up along these identified topics and tasked to first identify a vision of what the sector or the chain should look like in 5 years' time and then identify action points to be taken to move closer to that state. To further create more viable and realistic action points the task included the attribution of leading organizations or groups to implement the actions point, indicators of success and supporters required. In a wrap up session, the results were presented and a quick feedback round was held to validate the results and take note of possible ongoing initiatives which are addressing some action points already.

### 3 Background and key findings from the Value chain analysis

#### 3.1 Pigeonpea Tanzania overview<sup>1</sup>

A Value Chain Analysis of pigeonpea was conducted in Southern Tanzania between March and July 2013. The aims of this analysis were to map existing value chains in the Region, identify constraints on market performance and seek possible upgrading opportunities that might enhance chain performance. In addition the analysis aimed to identify and characterize the key actors and draw lessons from the Northern Tanzanian pigeonpea value chain which has been the beneficiary of long term assistance from ICRISAT.

The long term trend for pigeonpea is positive with consistent growth in the main area of demand (India) and rising year on year prices. Pigeonpea production has grown rapidly in Tanzania in recent years with 127% increase between 2009 and 2011. Tanzania is now the third largest global pigeonpea producer with nearly 300,000mt per annum. About 30% of this production is consumed domestically, either as a fresh vegetable or dried. The remainder is almost exclusively exported to India for 'dhal' production. A very small proportion (0.2%) is processed into dhal locally and exported to Dubai. This export is dominated by a very limited number of lead actors who are multi-national bulk commodity traders.

Production in Tanzania is divided into two distinct 'zones'. In the North (Arusha, Manyara and Dodoma), production is predominately of the white 'Babati' variety. In the South (Lindi, Mtwara, Ruvuma) only local varieties are grown. Production units are small, varying between

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<sup>1</sup> The full report "A Value chain Analysis for Pigeonpea in the Southern Regions of Tanzania", O. Mponda, B. Kidunda, B. Bennett and A. Orr (2013), ICRISAT Socioeconomics Discussion Paper Series #17, is available from <http://oar.icrisat.org/id/eprint/7955>.



1-3 ha and typically pigeonpea is inter-cropped with other food security staples such as maize, sunflower, sorghum and cassava. Yields are low, particularly in the South, at around 150kg/ha under inter-cropping. High growth in production in recent years is the result of farmers switching to pigeonpea as a cash crop, and not productivity gains.

The analysis identified five distinct value chains in Tanzania. The most important is the export of unprocessed grain which is done through a network of Primary Cooperatives, Export Agents and Speculative Traders who all procure on behalf of the Export 'houses'. Local sale of fresh pigeonpeas was found to be more important than expected, possibly reaching 10% of total production and representing a development opportunity.

The analysis found that a high proportion of farmers in Southern Tanzania are growing pigeonpea (about 80%). Inter-seasonal price variation is high offering the potential for arbitrage. Farmers are price takers and market information is unavailable. There are no grading or quality premiums in place and no contracted production. Pigeonpea seed is re-used and farmers do not apply external inputs.

Gross margin analysis demonstrates that, currently, pigeonpea is uncompetitive against the other main cash crop in the region, sesame, (Tsh 230,200/acre vs Tsh 194,000; USD 135 vs USD 115/acre for sesame) but that 'improved' production could give real gains.

Pigeonpea sits largely in a policy vacuum. There is no policy framework that currently includes pigeonpea. Data is poor, partly because pigeonpea tends to get aggregated with other beans and pulses.

To date, breeding of pigeonpea in Tanzania has focused on yield and color (white). The value chain analysis shows that premiums are available for market related characteristics, particularly milling qualities such as consistent grain size, shape and seed coat residue.

Findings and recommendations from the study included:

- Substantial productivity gains could be achieved in Southern Tanzania by dissemination of improved seed and management practices.
- A quality premium may be available for market related traits.
- The absence of government policy on pigeonpea is seen by many chain actors as an advantage.
- Little is known about the benefits of pigeonpea as an intercrop, but it is generally held that, under inter-cropping farming systems it confers advantages. More research is needed to support this contention.
- An opportunity exists to support and develop the fresh pigeonpea value chain which may have under-valued nutritional benefits that could be expanded.
- Farmers in Southern Tanzania do not use pigeonpea by-products.
- Post-harvest losses, particularly from pest damage, are substantial but unmeasured. Improved handling and storage practices would promote better retained seed and reduce enforced sale due to infestation.
- There is a lack of coordination and few development drivers for pigeonpea in Southern Tanzania. If the benefits of pigeonpea were known and suitable

seed/management packages available substantial productivity gains might be possible.

### 3.2 Groundnut Uganda overview<sup>2</sup>

Groundnut (*Arachis hypogaea* L.) is the second most important legume grown in Uganda after beans (Masette & Candia, 2007), with northern and eastern regions as the major producers (UBOS & MAAIF, 2010). However, the average crop area is small with a national average of 0.24ha. Production has increased in the last decade but yields remain low (600-700 kg/ha). Production is greatly affected by rosette, a field disease (Okello et al., 2010), and Aflatoxin, a postharvest constraint. The key actors in the value chain are seed producers, small-scale farmers, traders (wholesalers and retailers), processors, exporters and consumers.

Farmers grow both local and improved groundnut varieties with yields of improved varieties being higher by about 58%. Few farmers (about 46%) are aware of improved varieties, and only 39% have adopted them leading to low average productivity. Farmers produce groundnuts mainly for subsistence, selling on average 67 - 110 kg/season (13 – 22% of total production) with a margin of about US\$ 370 (USD 0.15) per kg. They sell groundnuts in either shelled or unshelled form to wholesalers, retailers, processors, and in some cases to exporters (shelled).

At trade level, there are wholesalers and retailers. Wholesalers deal more in shelled groundnuts and the dominant varieties are Red beauty, Serenut 4, Serenut 3, Serenut 2, Rudu white and Rudu red. They experience high seasonal supply and price fluctuations. Their margins on average are US\$ 1,586 (USD 0.62) per kg when they sell to retailers and US\$ 895 (USD 0.35) when they sell to processors. Very few wholesalers (about 15%) are aware of aflatoxin as a problem in groundnuts. Retailers also deal mainly in shelled groundnuts (71%) with dominant varieties being Red beauty, Serenut 2 and Serenut 4 because of their taste and marketability. About 43% of the retailers source groundnuts directly from small-scale farmers, while about 50% source from small- and large-scale traders (wholesalers). They mainly sell to final consumers at an average margin of US\$ 276 (USD 0.11) per kg. The majority (93.4%) of the retailers are not aware of Aflatoxin as a potential problem in groundnuts.

Processors buy groundnuts mainly from large-scale wholesalers. They process groundnuts into either flour or paste for consumption. Red beauty, Serenut 2 and Serenut 4 are the most preferred varieties processed. Processors incur various costs; the highest cost is milling the groundnuts into paste accounting for about 51% of the total cost. On average their margin is about US\$ 1,023 (USD 0.40) per kg. Only 13.7% are aware of aflatoxin.

The groundnut value chain has many opportunities the major being; high profits, readily available and growing market and the various processed products. The major

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<sup>2</sup> For further reading see ICRISAT Socioeconomics Discussion Paper Series #14 by Mugisha, J., Lwasa, S. and Mausach, K. (2014), "Value Chain Analysis and Mapping for Groundnuts in Uganda", available from <http://oar.icrisat.org/id/eprint/7737>.

constraints/challenges faced are; poor produce quality, supply and price fluctuations, high cost of transport, and limited capital that limits volumes handled. Very few value chain actors are aware of existence of aflatoxin implying they do not undertake deliberate measures to reduce it. Cleanliness of the grains, low moisture content, big grain size and attractive color are considered the main quality attributes. Ensuring good quality grains remains a challenge yet it is a prerequisite for accessing remunerative markets be it domestic or foreign.

Findings and recommendations from the value chain study are as follows:

- Groundnut crop is an important in Uganda's economy in terms of providing food for households and generating income to the various value chain actors.
- Despite its importance, the yield is low due to lack of farmer awareness, unavailability of improved seed in adequate amounts, low adoption of high yielding varieties, and fluctuating prices.
- The value chain is characterized by poor quality groundnuts (related to aflatoxin), seasonality in supply, and high processing costs.
- The value chain has a number of opportunities that can be exploited for upgrading.
- Seed production programs should be supported to produce high yielding seed in adequate quantities.
- Storage facilities to overcome the seasonality issues should be promoted.
- Awareness campaigns on aflatoxin and other quality issues should be carried out.
- Processors should be assisted to access simple but efficient and quality equipment.
- The government and other organizations involved in infrastructure development should do more in developing the roads and other production and market infrastructure.
- Capacity of value chain actors should be built mainly through training so that the major drawbacks are turned into opportunities for increased profitability.

## 4 Verification of the results

### 4.1 Pigeonpea in Tanzania

By and large the participants at the workshop concurred with the findings of the pigeonpea Value Chain Analysis. Some key additional recommendations and discussions are summarized below.

*Emergence of new NGO's working with pigeonpea in Southern Tanzania:* Since the analysis was conducted in 2013 a number of new NGO's have started working with pigeonpea farmers in Southern Tanzania. These include the Aga Khan Foundation, the ETG Foundation and Limas.

*Availability of new pigeonpea varieties on station, but not yet released:* A small breeding program has been going on at Naliendeli Agricultural Research Institute in Mtwara and some promising varieties are ready for release, including varieties that are preferred for fresh vegetable use. The absence of a seed production and distribution infrastructure in the region constrains progress with distribution of this germplasm.

*Processing opportunities for SME:* Pigeonpea is sold domestically in Tanzania unprocessed and loose. Regionally, particularly in Kenya, packed, branded and partially processed pigeonpea has started to appear in shops. This small scale processing may represent an upgrading opportunity food processing enterprises.

*Development of local dhal market in Tanzania:* The Value chain analysis found that Tanzania consumers are not partial to dhal and that this has, to some extent, held back domestic, urban, demand for pigeonpea in Tanzania. The workshop was keen to explore this issue further and to promote greater domestic utilization of pigeonpea.

*Promotion of production in other East African Range states:* Commodity traders see East Africa as a whole in terms of supplying large contracts for pigeonpea to Indian processors. Comparators between supplying countries include aspects of quality and price. It emerged from the workshop that efforts are underway from the side of exporters to promote increased production in Mozambique and Zimbabwe.

## 4.2 Groundnut in Uganda

Groundnut is a very high value crop in Uganda, and production should be market driven. Market expectations should be worked out and produce and supply volumes and quality as demanded by the market.

Farmers always get very low market shares. Farm-level organizations need to be emphasized; train and inform the farmers, for example what varieties give them maximum returns.

National Agricultural organization (NARO) has been involved in breeding programs to produce improved varieties that are high yielding, disease and pest resistant and with attributes preferred by the farmers and consumers. For example *Serenut 4* has been upgraded to *Serenut 6*. However, the capacity to produce and disseminate the seed in adequate amounts is low.

There are new improved groundnut varieties that are currently under trials (on-station and on-farm). A case in point is *Serenut 14* available at Serere Agricultural and Animal Production Research Institute (NaSAARI). It was noted that researchers are moving very fast and leaving behind the farmers. It was recommended that NARO needs to popularize the new varieties among farmers at the same pace as research is conducted.

Although value chain actors mainly preferred the red varieties e.g. Red beauty to the white ones e.g. Rudu white, the varieties are not different in terms of nutrient content and taste.

To increase the availability and access of improved seed by farmers, it was recommended that new seed producers should be brought on board to supplement what NARO is currently doing. This could be through training, licensing and supporting private companies and individuals

Private Sector Foundation Uganda is supporting value chain development and the oilseed sector where groundnut falls is one of the Foundation's priorities. Where value chain studies have not yet been done, the studies will be done to identify areas of the chain that will need

intervention through supporting the value chain actors after submitting competitive and feasible proposals.

### 4.3 The emerging topic clusters of upgrading

The three main clusters that emerged from the group discussion of upgrading options and the recommendations from the two reports were: Seed related issues, farming systems and farming practices as well as quality assurance and related policies. Under each topic themes of upgrading action areas were identified:

Table 1: Themes and upgrading options

Theme	Upgrading options
Seed	<ul style="list-style-type: none"> <li>Increased availability of improved seed</li> <li>Increased adoption of improved seed;</li> <li>Policy environment conducive for seed production.</li> </ul>
farming systems	<ul style="list-style-type: none"> <li>Increased adoption of Good Agricultural Practices including the increased use of improved seeds</li> <li>Development of production manuals for the two crops</li> <li>Training and demonstration of Good Agricultural Practices to farmers</li> <li>Increased adoption of recommended Post Harvest Handling practices</li> <li>Training and demonstration of improved Post Harvest Handling practices</li> </ul>
Policy and quality	<ul style="list-style-type: none"> <li>Productivity for pigeonpea s and groundnuts using existing land and labor resources should be doubled by 2019</li> <li>All pigeonpea and groundnuts should be 'premium' products and should be receiving premium prices on world markets</li> <li>All consumption and sales of pigeonpea and groundnut should be effectively aflatoxin free (e.g. below the lowest internationally accepted limit) and the effort to achieve this should be regional</li> <li>Affirmative government policies should specifically recognize the strategic potential of groundnuts and pigeonpeas</li> <li>Information on groundnut and pigeonpea should be much more readily available.</li> </ul>

## 5 The action points identified

### 5.1 Seed

#### Theme 1 - Increase availability of improved seed

Increase improved seed breeding by NARO, and production (multiplication) by involving other actors such as farmers, NGOs and the private sector. This will increased quantity of quality seeds, and the number of farmers accessing and growing the improved seeds will invariably increase. With increased research work, many varieties will be available from which the farmers and seed stockists can choose. It is also envisioned that the number of seed stockists selling quality seeds will increase implying that it will be easier for the farmers to access seeds from a range of stockists.

## **Theme 2 - Increase adoption of improved seed**

This is to increase productivity which is currently much lower (150kg/ha for pigeonpeas and 600-700kg/ha for groundnuts) than the potential. The key issue is to increase adoption level of improved seeds to at least 50% and double productivity in the next 5 years. Some of the identified options are:

A tendering the process of seed production/multiplication to competent farmers, NGOs, CBOs and private companies to ensure the right quality and quantity of improved groundnut and pigeonpea seeds are available to the farmers. Currently seed multiplication process is limited to a few companies that are under the control and surveillance of National Seed Certification units. Because of their limited number, the quantity of seed that can be raised is limited thus training the tendered seed producers, and facilitating the Seed Certification Units to monitor the process of seed multiplication would additionally benefit the process.

Intensifying demonstration of improved seed; farmers and farmer associations should be encouraged to participate in seed demonstrations. Alongside promoting improved seed through various media (radio, newspapers, TV, fairs, field days); farmers and farmer associations should be encouraged to participate in seed fairs and field days to demonstrate to their fellow farmers the performance of the improved varieties.

Conducting field performance monitoring would ensure quality and building credit worthiness of the seed producers for financial support; and facilitating continuous communication among all the seed value chain actors and supporters would enable improved coordination within the chain.

## **Theme 3 - Conducive policy: policy environment need to be made conducive for seed production**

This involves: Delegation of seed certification such as licencing individuals and companies would lift pressure from a stretched public seed system. Currently there are very few producers of quality seed making seed not readily available to farmers. To ensure quality this has to go along with another general recommendation of strengthen the certification system to control fake seed, and put punitive action against seed suppliers and vendors of fake/adulterated seeds.

To increase the number of registered agro-dealers in order to easily avail quality seed to different corners of the countries in the region, decentralizing the process of registering agro-dealers at zonal levels could have advantages.

Increase budget allocation to the seed sector e.g. at 1% of export revenue goes to legume and oilseed to support seed research and production. The relevant regulatory bodies /authorities need to be availed with adequate resources for seed production and monitoring.



## **5.2 Farming Systems:**

### **Theme 1: Good Agricultural Practices**

Farmers are to adopt good agricultural practices starting with demanding and utilizing improved seeds for the production of groundnut and pigeonpea. Farmers also are to manage the crops as cash crops and apply good agricultural practices including but not limited to timely land preparation, planting and weed control. While farmers have to change their production system extension agents who are specialized in the crops can support them.

### **Theme 2: Development of production manuals for groundnut and pigeonpea**

The participants felt that simple production manuals have to be developed for pigeonpea and groundnut farmers. The manuals should be built along the production cycle of the crops and use a participatory and action oriented approach, similar to the production manuals developed by Aga Khan Fund for Economic Development for other crops.

### **Theme 3: Training and demonstration of Good Agricultural Practices to farmers**

Farmers training shall be conducted using farmers' fields as demonstration fields. Farmers should be encouraged to regard groundnut and pigeonpea farming as business and not as a project. Participating farmer organizations should have clear guidelines what is expected from farmers, e.g. adoption rate of timely actions in growing groundnut and pigeonpea.

### **Theme 4: Good Post Harvest Handling Practices**

Farmers need to implement improved post-harvest handling practices for both crops. For groundnuts this also includes use of appropriate shelling machines that ensure minimal breakage of groundnuts. Farmers have to utilize improved post-harvest handling practices also for groundnut and pigeonpeas as they do in other crops, e.g. drying on a tarpaulin. Farmers also have to explore the correct storage technology, whether for on farm storage or group storage facilities.

### **Theme 5: Training and demonstration of improved Post Harvest Handling practices**

Farmers need to better understand the opportunities of improved post-harvest handling. Participatory and action oriented training models shall be employed to demonstrate farmers on appropriate practices to reduce post-harvest losses and maintain a quality crop.

## **5.3 Policy and quality**

### **Theme 1: Productivity**

All countries need to improve the quality, quantity and availability of improved seed and better management practices. It was also felt that, with a better production package and more information about the income potential, both pigeonpea and groundnut could be promoted on a larger land area.

## **Theme 2: Premium Quality**

A set of simple agreed standards that provide premiums to producers of the quality of products desired by the market needs to be agreed and applied in the field in collaboration with all market actors. A simple testing and payment structure should be aligned to this.

## **Theme 3: & 4: Strategic management of Aflatoxin**

A range of actions are needed to address the issue of aflatoxin including making consumers aware of the potential dangers and address the issues related to locating contamination within the value chain. Identification of specific contamination hot spots where extra support is needed would be a good place to start. A testing device/mechanism that is cheap at the first point of harvest/sale is needed. More research and innovative thinking in the area of social regulation and peer quality control may support the capacity building and training that is undoubtedly needed to address this problem. A cheap and effective means to trace back where contaminated product enters the system would be useful. Finally, there are still many technical solutions to aflatoxin contamination that have not been tested or adapted to specific value chain in the target countries.

It was felt strongly that all countries in East Africa needed to take a common stand on aflatoxin contamination and that common approaches and policies should be adopted. This suggests that some regional aflatoxin coordination and advocacy body may be called for.

## **Theme 5: Policy**

More evidence is needed to support the inclusion of groundnut and pigeonpea in the strategies of target governments. The importance of including local government in the policy discourse should not be overlooked. Neither should private sector actors be excluded from the dialogue, particularly influential actors such as commodity traders and exporters.

## **Theme 6: Information symmetry**

Groundnut and pigeonpea need to be included in the existing market information gathering and dissemination systems in the target countries.

There would be considerable advantage to having a pigeonpea and groundnut information clearing house (possibly a managed LinkedIn page) where practitioners could share information on new initiatives and projects.

It would be very useful to have a central managed repository for data and information for both crops, possibly based around a community of practice for each.

## **5.4 Common actions points**

*Seed production and availability:* Better seeds need to be released and allied to improved geographically specific management recommendations. There is limited interest by the private sector to invest in production of improved seed for both crops.

*Quality and standardized products:* Production of quality standardized products is key in increasing the value/returns of the groundnut and pigeonpea value chains. The workshop



noted that the margins received by the various key actors were low. The low margins are partly explained by production of varieties with attributes of low preference (hence low demand), and low quality products that fetch low market prices. Where the margins seemed high, it is because of the high costs that are incurred in the process adding value and marketing.

*Organized stakeholders' platforms:* there should be organized stakeholder platforms composed of the key value chain actors through which issues of supply (quantity/ volume), quality and prices of groundnut and pigeonpea products can be addressed.

*Formation and sustainability of producer organizations (and cooperatives)* should be facilitated. This will increase access to extension and advisory services, credit, collective marketing and getting better prices.

*Information management and communication:* Information on groundnut and pigeonpea value chains is not readily available and communication among the various value chain actors is not efficient. Information should be made more readily available and communication should be enhanced. This should be done by having centrally managed units that receive, process and disseminate information to the groundnut and pigeonpea value chain actors. The location of the centers/units should preferably be in areas or regions where the crops are concentrated for ease of access.

Closely related to the communications problem is the lack of specific data on both crops in both countries which limits the possibilities of private sector players to engage more in the chains. Both chains would likely benefit if data would be made available which would for example make demand for seed more predictable and thus enable private seed companies in producing seed at lower risk.

Popularize the improved groundnut varieties among the value chain actors to give them an opportunity to select among the many available, what is the best for them and for their customers.

Among the general action points which are applicable for both chains, groundnut has the specific challenge of Aflatoxin/mycotoxin which requires specific actions.

*Mycotoxin management:* Particularly the management of aflatoxin is very vital to keep it to WHO acceptable levels. Currently the levels are unacceptably high; and there is no premium price for aflatoxin-free products. This mainly affects the export market for groundnut in particular. All the East African countries should have same and enforceable quality standards regarding aflatoxin.

One crop and region specific problem was identified in the emerging southern production region of Tanzania where farmers have less access to information and seed as the area is not traditionally growing the crop. Pigeonpea production in Southern Tanzania needs a specific action plan focused on providing improved seeds, specific management advice and postharvest handling recommendations specific to the region and the demands of the market.

## 6 Summary and conclusion about key action points for the region and the combinationability of value chains across crops/countries

The two-day cross country workshop covering two value chains inspired all participants to have a fresh look at their value chains and produced a number of results outlined above. Starting from the results of the detailed value chain analyses conducted in 2013 the participants identified three key areas for strategic intervention, i.e. improved seed availability and adoption by farmers; good agricultural practices including post-harvest handling and policy and quality. The areas identified in the workshop are generally applicable to both value chains and both countries with minor adjustments of the detailed messages to the specific crop and country.

While the areas of strategic intervention are similar in both settings the actions required to improve the performance of the two value chains are specific to each value chain for good agricultural practices, and as identified by the participants for pigeonpea might even need specific action in different growing regions based on the historic and cultural background in pigeonpea growing. Still the same methodology for the development of demonstrations and trainings can be used for both crops and in both countries, especially as both crops are legumes. In the other two areas of strategic intervention, improved seed availability and adoption by farmers and policy and quality, the approaches to improve the value chain performance can be used in both value chains and countries. Policy and quality related issues should be implemented on the level of the East African Community but the development shall include government on the local level. This includes a common stand in East Africa on aflatoxin to ensure the highest possible effect and possibly some regional aflatoxin coordination and advocacy body.

The availability of improved seeds is discussed in both value chain studies at length and was identified by the participants of the workshop as a key area for strategic intervention. Still it needs to be handled also as a separate seed value chain and could be seen as a required follow up study. The issues constraining the availability of the right seed in the right quantity are not limited to groundnut or pigeonpea but affect most staple food crops in East Africa, maize being an exception. A better adaptation of improved seeds will significantly contribute to food and nutrition security in East Africa and an analysis on why the performance of the food crop seed value chains are underperforming might be an interesting action point to drive forward in the region. Here a concerted approach to improve the performance of seed value chains across countries would create great synergies. This could result in improved food and nutrition security.

In general, by combining two workshops that are typically held separately by country and/or crop significant value was added. First and foremost the participants were forced to abstract from their focus crop and think in more general terms as the group would otherwise not come to consensus. This already enables a higher level of aggregation and will make the results more policy relevant. Furthermore, the inclusion of two country teams and the relatively small group size for multi country meetings does make the participants feel less intimidated and encouraged lively discussions and sharing of lessons and practices which have been tried in the respective chains. Both countries experience a low level of policy engagement on their crops. By engaging in this workshop the participants were able to

share strategies to raise awareness of the great potential of these species for smallholder poverty alleviation in their respective countries.

## 7 Envisioned way forward

The workshop aim was the generation of ideas for upgrading the value chains in both countries and to enable the sharing of lessons from previous or current projects. This set up was envisioned to then be utilized for future reference when projects are being planned in both countries and possibly already make people aware of potential partners and initiatives attending the workshop or being identified during the discussions.

In addition, this report is not only aiming as a reference for the participants but is also meant to be useful resource for donor agencies or NGOs working in the two chains or planning to work in the two countries and consider options for investments. Stakeholders in the sector can then prioritize from the list of potential beneficial actions according to their individual capabilities and / or priorities.

This discussion paper is thus intended to stimulate further actions and discussions in the sector rather than producing a workplan for the participants to follow. The list of participants is not included in this paper for privacy reasons. However, the authors are available to facilitate connections to the participants to enable following up on ideas by interested parties.

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## Appendices

### Group work results

#### Policy group

#### VISION

Action	Who is leading	Indicator	Supporter	Remarks
Increased use of improved seeds	- Farmers and farmers organizations	- % of area planted with improved seeds - Number of farmers using improved seeds	- Extension agents	- Identified source of improved seeds to be planted by farmers
Increased adoption of GAP	- Farmers and farmers organizations	- Adoption rate	- Extension agents	- Time land prep - Time planting - Good spacing - Disease control
Development of production manual	- Consultant (SMS) - (Researcher)	- Number of manuals distributed	-	-
Training and demonstrating GAP to farmers	- Extension agents	- Number of farmers trained	-	-
Increased adoption of recommended PHH (post-harvest practices)– practices	- Farmers	- Number of farmers practicing PHH practices	- ICRISAT/ - MINISTRY OF AGRICULTURE	- Drying, shelling - Storage tech
Training and demonstrating to farmers usage of improved PHH – practices	- Extension workers	- Number of farmers practicing PHH practices	- ICRISAT/ - MINISTRY OF AGRICULTURE	- Drying, shelling - Storage tech
Train and introduce usage of appropriate harvesting technology	- Extension workers -	- Number(%) of harvesting technologies being used by farmers	- ICRISAT/ - MINISTRY OF AGRICULTURE	- Drying, shelling - Storage tech

## Farming systems

### WHERE WE WANT TO BE IN FIVE YEARS

Increase production of groundnuts in Uganda and pigeon peas in Southern Tanzania from 230,000MT to 45,000MT and 270,000MT to 500,000MT respectively by year 2019.

### STEPS

- Increase farmer accessibility of improved seeds and other agricultural inputs
- Training and demonstrating Good Agricultural Practices (GAP)
- Training in recommended Post Harvest Handling
- Facilitate Organized Marketing System

Action	Who is leading	Indicator	Supported by
<b>1. All products premium</b> <ul style="list-style-type: none"> <li>- NFORDS assessment</li> <li>- Grading/ standards</li> <li>- GAP/simple testing</li> <li>- Appropriate payment structure</li> <li>- Promotion</li> <li>- What happens to Rejections?</li> <li>- Training</li> </ul>	Researchers Standards body Coops/donor Coops/traders/association Commodity association/body ??? Extension/ coops/researchers		
<b>2. Production</b> <ul style="list-style-type: none"> <li>- PP in S. Tanzania – production plan</li> <li>- Produce, promote, adopt better seed</li> <li>- adopt improved management</li> <li>- area expansion</li> <li>- intensification</li> <li>- switch from other crops</li> </ul>	Ministry Researchers Research + extension  Local government	Plan published by 2016 $\frac{3}{4}$ new in Tz /Ug by 2017  Extension messages disseminated by 2017	Ngo's  Media
<b>3. No aflatoxin</b> Consumer/producer awareness, sensitization	Consumer protection, association		

<p>Id hot spots/needs assessment</p> <p>Curap testing</p> <p>Social regulation/enforcement</p> <p>Training and capacity building</p> <p>Test and introduce new technologies – drying and bags</p> <p>Traceability</p>	<p>NARO/ARI</p> <p>Donors</p> <p>Donors/researchers</p> <p>Universities</p> <p>Naro/nari</p>		<p>Marketer</p> <p>Ngo's</p> <p>Sida</p>
<p><b>4. Regional Afla-control strategy</b></p> <p>Harmonized standards/regulation</p> <p>Regional afla forum/</p> <p>Institutional advocacy</p> <p>Propper – coordination across countries</p>	<p>EA standards authority</p> <p>Regional body</p>		<p>National standards bodies</p>
<p><b>5. Gn + pp policy priority</b></p> <p>Collect evidence</p> <p>Make strategic case for these commodities</p> <p>Promote to ag sub committee/parliament</p> <p>Lobby at review of national plan</p> <p>Lobby mixed marketing board</p> <p>Publish <i>grey</i> facts</p> <p>Lobby districts/local govt ag programmes councils</p> <p>Engage private sector</p>	<p>Policy + planning ministry of agriculture</p>	<p><b>Published 2015</b></p> <p>International ag plan by 2016</p> <p>Subset by 2015</p> <p>In local plans by 2016</p>	<p><b>Private sector</b></p> <p>Research stations</p>
<p><b>6. Information symmetry</b></p> <p>-market information, prices, volumes</p> <p>-research information – community or practice</p> <p>Basic statistics</p> <p>Stakeholder information (who is doing what where?)</p> <p>Production information (weather, soil)</p> <p>Standard/quality information</p>	<p>'martin fowler', coops, mis</p> <p>Icrisat</p> <p>Min of ag +local government</p> <p>Icrisat</p> <p>Min of ag</p> <p>-bureau of standards</p> <p>-private sector</p>		<p>Aphlis</p>

## Seed sector

### WHERE WE WANT TO BE IN FIVE YEARS

***Productivity increased by 20% in five years – double the yield***

Action	Who is leading	Indicator	Supporter
<ul style="list-style-type: none"> <li>- Seed production increased by involving other actors</li> <li>- Tendering production at PPQ groundnuts improved seeds</li> </ul>	<ul style="list-style-type: none"> <li>- Farmers, NGO's, farmers groups</li> <li>- Selected lead companies (with tender)</li> <li>- Trained farmers and farmer groups</li> </ul>	<ul style="list-style-type: none"> <li>- Increased quantity of quality seeds produced</li> <li>- Number of farmers growing seeds increased.</li> <li>- List of varieties multiplied increased</li> <li>- List of stockists and the quantity of seeds increased</li> </ul>	<ul style="list-style-type: none"> <li>- Researchers, breeders,</li> <li>- Financial service providers</li> <li>- Development partners</li> <li>- Extension officers(private and public)</li> <li>- NGO's</li> <li>- Cooperatives</li> <li>- Community leaders</li> <li>- Input suppliers companies</li> <li>- Ministry of Agriculture</li> </ul>
<ul style="list-style-type: none"> <li>- <b><i>Adoption levels of improved technologies increased by 10% per year – 50% in 5 years</i></b></li> </ul>	<ul style="list-style-type: none"> <li>- Intensification of demonstration of improved seeds</li> <li>- Promotion through radios, tvs etc</li> <li>- Field performance monitoring</li> <li>- Ongoing communication between all seed actors</li> <li>- Extension (SMS) for groundnuts and pigeon peas</li> <li>- and supporters</li> <li>- Building credit history of</li> </ul>	<ul style="list-style-type: none"> <li>- No of demonstrations,</li> <li>- No of seed fairs held and farmers participated</li> <li>- No of farmers participating in demonstrations</li> <li>- No of farmer field days held</li> <li>- No of adopters</li> <li>-</li> </ul>	<ul style="list-style-type: none"> <li>- Delegated seed certification (licensing some individuals, companies etc</li> <li>- Decentralized process of registering agro-dealers at zonal level</li> <li>- Budget allocation to the seed sector (1% of export revenue goes to legume and oil seeds to support research and seed production)</li> <li>- Strengthening the</li> </ul>



	seed producers for financial support		certification system (to control fake seeds) - NGO's, MoA, Development partners, private companies, research institutions, LGAs.
<b><i>Conducive policy environment on seed production</i></b>	- MoA – DRD, TOSCI,DPP, ASA, (seed regulatory board/Authority), TASTA	- Increased number of registered agro-dealers - Reduced time length to register agro-dealers and seed producers - Availability of resources for seed production and monitoring - More new varieties and maintenance of the already available - Availability of quality seeds - Awareness of farmers on improved varieties - Tough action taken against fake seed suppliers	- Official seed certification institute - LGA - Farmers - Ministry of finance and MA -